

PATENT SPECIFICATION

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(54) AN APPARATUS FOR AND A METHOD OF CREATING A VISUAL REPRESENTATION OF HEADS OR FACES

(71) We, THE COUNTY COUNCIL OF THE ADMINISTRATIVE COUNTY OF KENT, a Corporate Body, of County Hall, Maidstone, Kent, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention concerns improvements in or relating to the creation of visual representations of heads or faces, and more particularly relates to a method of and apparatus for producing such representations.

Whilst the apparatus and method according to this invention may if desired be used for purposes of advertising or amusement, they are primarily intended for use in the creation of visual representations which will correspond with recollected features of a head or face previously seen. They are particularly, but not exclusively, intended for use by Police Forces for instance in criminal investigation when questioning witnesses.

In criminal investigations at present, witnesses may be asked to examine collections of photographs in the hope that they can select from them one which they recognise as identifying someone connected with the crime in question. This procedure is usually applicable only to photographs of known criminals so that there is always a possibility that the police have no photograph of the person to be identified. The procedure of examining large numbers of photographs is often confusing as well as tiring for a witness. It generally involves taking the witnesses to the place where the photographs are kept and it frequently results in the witness' recollection being impaired as a result of seeing so many different pictures in succession. Such photographs do not take into account aging of the subject.

Another method currently used for creating such visual representations involves the questioning of a witness as to the features of shape, configuration, colour and other characteristics

which he recalls. The questioner then endeavours from the answers he receives to build up by means of a series of superimposed line drawings on transparent material a representation of an individual. This involves the use of a large number of line drawings of heads, faces, and individual features. It is consequently quite costly to use. Furthermore it can only be used by a trained operator and as a consequence is generally not widely or rapidly available for use as is desirable if a witness is to be questioned before his memory starts to fade.

It is one object of this invention to provide an improved method of and apparatus for the production of visual representations of heads or faces which is simple to operate without any extensive training, easy to transport and the cost of which is such that it is feasible to arrange for widespread distribution of the apparatus involved.

The invention is based on the realisation that a witness of some incident involving an individual will generally recall, in addition to special and peculiar features of that individual, an outline shape of the head or face of that individual. It has been found that by providing a comparatively small number of different basic shapes of human heads or faces, it is possible to reproduce an almost infinite number of different outline shapes by selecting a basic shape and then varying the relative inclinations and/or spacing apart of the sides of that shape with respect to its central axis of symmetry.

According to one aspect of the present invention there is provided a method of creating a visual representation of a head or face, including the steps of selecting a basic shape of head or face from a set of such basic shapes, positioning such basic shape adjacent to a reflecting surface so as to produce partly from the basic shape and partly from its reflection in said surface the outline of a head or face, causing relative movement between the selected basic shape and said

reflecting surface until said outline corresponds to a desired outline, securing said basic shape in the desired position with respect to said reflecting surface, and applying to said basic shape and/or its reflection one or more selected facial features.

According to another aspect of this invention there is provided apparatus for creating a visual representation of a head or face comprising a set of basic shapes of heads or faces, a set of facial features, a base surface, a substantially planar reflecting surface and means for mounting said reflecting surface in such a position with respect to said base surface that when a selected basic shape of head or face is disposed on said basic surface and is moved relative to the line of intersection of the base surface and the plane of the reflecting surface, varying outlines of head or face are reproduced partly from said basic shape and partly from its reflection.

The basic shape may be of one half of the head or face based on a central vertical axis, the other half being provided by the reflection in the reflecting surface, but it is preferred to provide each basic shape as a complete outline of the head or face so that either side thereof may be reflected from the reflecting surface. In this way non-symmetrical features, such as facial blemishes on either side of the face may be marked onto the reflecting surface so as to appear on one side only of the visual representation.

By the expression "facial features" we include details of features such as hair, eyes, eyebrows, mouth, nose, ears, teeth, lips or other facial identifying marks. These may be incorporated in the visual representation by selecting from the set of such facial features provided those corresponding in shape and, if desired, colour to recollected features. Such selected features will then be positioned on the above mentioned outline so that the feature or features and their reflections provide the desired visual representation.

Preferably all of the basic shapes and all of the facial features are photographic reproductions which may be in colour. However, they can be drawn or painted shapes.

In order to permit the widest use of visual representations produced by means of the invention, it is preferred to make photographs of such representations.

The said base surfaces may be planar or, if desired, may be slightly concave or convex.

The reflecting surface is preferably a plane mirror having a pair of legs at two opposite edges by which it can be mounted in slots or recesses formed in the base surface or a frame thereof. Generally the reflecting surface will be arranged at right angles to said base surface although, if desired, provision can be made for varying the angle between the base surface and reflecting surface.

Preferably apparatus according to the invention will include a plurality of sets of different shapes and of different colours of human features e.g. hair, eyes, eyebrows, mouth, nose or ears from which features can be selected for application to a selected shape of face formed as above set forth.

It is preferred that all of the basic shapes of head or face and all of the features shall be securable in a selected position in relation to the base surface. To achieve this they may be made of or mounted on sheet material suitably coated to permit them to adhere to the base surface by light pressure whilst being readily stripped off without being destroyed.

Apparatus according to the invention preferably also includes means for rapidly selecting one from a number of different basic shapes of head or face. It has been found that a particularly effective way of presenting varying basic shapes of head or face is to take a selected shape in the form of a blank silhouette on white or preferably a white silhouette on black. Having made such a silhouette, a succession of variations of the original is made by varying the spacing and mutual inclination of the sides to each other.

By making a large number of variations on a basic shape and presenting them in rapid sequence to a witness, it is possible for the witness to concentrate only on outline shapes and to select whichever outline most nearly agrees with a recollected shape.

It has been found that by using a relatively small number e.g. about 16, of different basic shapes and producing sets of variations of each basic shape a wide variety of human heads or faces can be reproduced in outline form.

A particularly convenient way to present these basic shapes and their variations is to assemble each basic shape and its set of variations in the form of a so called flick book so that by running a finger over the edge of the book a rapidly changing shape can be viewed.

Such flick books can be made up to have two or more different basic shapes and their variants arranged in rows, or they may be arranged on opposite edges of a single book. Viewing of the changing shapes is facilitated if, before assembling the pages together, the latter are fanned.

Each basic shape and its variations will be numbered or otherwise identified so as to coincide with identifications on the set of basic shapes to be used in the method according to the invention.

It is particularly preferred to provide apparatus according to the invention in the form of a box which has the base surface fixed therein and which incorporates mounting slots for the legs of the reflecting surface, said box additionally serving to house all the basic

shapes, facial features, flick books and other accessories needed for producing a visual representation.

- 5 One preferred embodiment of the method of the invention and of the apparatus of the invention will now be described with reference to the drawings accompanying the Provisional Specification in which:

- 10 Figures 1 to 5 shows a sequence of variations of a single basic shape of the outline of a human face;

Figure 6 shows a kit of parts which includes apparatus according to the invention;

- 15 Figure 7 shows apparatus according to the invention assembled so as to produce a desired visual representation of a human face.

Figure 8 shows a view similar to Figure 7, but of a different representation of a human face;

- 20 Figure 9 shows an example of a book from which a basic shape may be selected, and,

Figure 10 shows a further example of a book from which a basic shape may be selected.

- 25 Figures 1 to 5 show the principle on which the present invention is based. Figure 1 shows a basic shape of the outline of a human face which is symmetrical about a central vertical axis. By moving the two sides relative to one another, a set of variations of this basic shape may be produced. Thus in Figure 2, the relative inclinations of the left and right side of the basic shape have been altered so as to move the upper end of the two sides apart from one another, thus providing an outline having a narrow chin and a wide forehead.

- 30 In Figure 3, both the upper part and lower part of the two sides of the basic shape have been moved apart thus providing an outline having a wide forehead and a wide chin.

- 40 In Figure 4, the bottom part of the two sides of the basic shape have been moved apart, the upper parts remaining close together so that an outline having a narrow forehead and a wide chin is produced.

- 45 In Figure 5, the two sides of the basic shape have been moved together again so as to provide a similar outline to that of Figure 1.

- 50 It can thus be seen that by taking a basic shape and moving the two sides apart or inclining them relative to one another a set of variations of that basic shape can be built up. The set of variations will include other variations intermediate those illustrated in

- 55 Figures 1 to 5. It has been found that by taking a number such as for example 16 different basic shapes and preparing sets of variations in the manner above described a very large number of outlines can be provided from which a witness can make a selection.

- 60 One aspect of the invention provides apparatus for reproducing variations of a selected basic shape so as to reproduce a visual representation of a human face. This apparatus is

shown in Figure 6 and comprises a base surface 10 which is a convex surface. The apparatus also includes a planar reflecting surface in the form of a mirror 11, the mirror being mountable on the base surface 10 by means of legs 12 inserted into slots 13 in the base surface. The legs and slots are arranged such that when the mirror 11 is mounted on the base surface 10 a small space 14 remains between the base surface 10 and the edge of the mirror closest the base surface. The mirror 11 is arranged to be mounted at right angles to the base surface 10, and extends along a generator of the curved base surface.

The apparatus also includes a set of the basic shapes of face 15, these basic shapes being provided in the form of sheet material, the back of which is coated with a peelable contact adhesive and which each carry a photographic reproduction of a face which may or may not include the hair and ears but which does not carry any other features of the face such as eyes, nose or mouth.

The apparatus also includes, in sheet form, representations of single eyes or pairs of eyes 16, hair 17, noses 18, mouths 19, eyebrows and spectacles, and these sheets are also coated on the rear surfaces with a similar contact adhesive.

It will be understood that both the sheets carrying the basic shape 15 and the other sheets 16, 17, 18 and 19 will normally be provided in natural colours. Thus various representations of eyes may be provided having different coloured pupils.

As shown in Figure 6, the apparatus is provided in the form of a kit including a box 20 having two layers 21 and 22 the base surface being mounted in the lower layer 21. The upper layer 22 provides a compartment within which the various accessories to the apparatus may be stored such as the sheets carrying a set of basic shapes 15 and the mirror 11. The box is provided with a lid 23.

To build a visual representation of a face using the apparatus, the mirror 11 is mounted on the base 10 by inserting the legs 12 into slots 13. A selected basic shape 15 is then inserted into the gap 14 between the base surface 10 and mirror 11 until the edge of the mirror 11 facing the base surface lies approximately along the central axis of the basic shape 15. The basic shape is then viewed from a position along the plane which bisects the angle between the base surface 10 and the reflecting part of the mirror 11. In this way, a visual representation of the outline of a face is presented to the viewer, one side of the representation being provided by direct viewing of the projecting part of the basic shape 15 (i.e. that part of the basic shape 15 which projects from the viewers side of the gap 14) and the other side being provided by the reflection of that one side in the mirror 11.

By moving the basic shape 15 about this position across the base surface 10 i.e. by pivoting the shape with respect to gap 14, an infinite number of variations of this basic shape similar to those shown in Figures 1 to 5 can easily be formed. For example, by moving the end of said projecting part of the basic shape 15 which represents the forehead away from the plane of the mirror across the base surface 10, a representation corresponding to Figure 2 can be produced. By moving the whole of said projecting part of the basic shape 15 away from the plane of the mirror 11 across the base surface, but maintaining the axis of symmetry of the basic shape 15 parallel to the mirror 11, a representation corresponding to Figure 3 can be obtained. By moving the part of said projecting part of the basic shape 15 which represents the chin away from the plane of the mirror 11 across the base surface 10, a representation corresponding to the Figure 4 can be produced.

Having found that position of the basic shape 15 which gives an outline as recollected by the viewer the shape 15 is lightly pressed onto the base surface 10 to which it adheres.

Other facial features such as the eyes, eyebrows, nose, mouth, and spectacles and, if not already included, the hair or ears, may now be added. A representation of a single eye may be moved across the part of the basic shape 15 which projects from beneath the mirror until when viewed as above described, the eye and its reflection in the mirror appear to be spaced apart the required distance, at the required height and at the required inclination. Similarly, the selected nose may be moved across the projecting part of the basic shape 15 so as to provide the required shape and size of nose and, when correctly positioned, may be pressed onto the basic shape 15 so as to adhere to it. Similarly the mouth and hair may be positioned and stuck onto the basic shape 15. A variety of expressions can be produced by varying the angle of the mouth 19. If the correct ears are not already provided on the basic shape 15 a selected representation of ears may be similarly positioned. If the eyebrows are provided separately from the eyes, the eyebrows may be similarly positioned.

It will be appreciated that the use of a convex base surface 10, will give a three dimensional effect to the visual representation.

Figures 7 and 8 show two different visual representations built up in this way. The basic outline of both representations is the same, but, as can be seen, by moving the basic outline 15 and the eyes, nose, and mouth, distinctly different representations may be built up.

The description so far has not referred to which side of the visual representation of the face is being reflected and which side is being

viewed directly. It will be seen from Figure 6 that the sheets carrying the basic shape 15 carry a complete outline of a face. Thus the sheet 15 may be used to build up either side of a face on the base surface 10 when used with suitably printed sheets of eyes and other features. Thus by reversing the mirror 11, either side of the representation of the face may be provided by reflection in the mirror. This allows for the addition of non-symmetrical facial features such as scars and other skin blemishes. Such non-symmetrical features may be drawn onto the mirror 11, if they are to appear on one side only of the visual representation. They will usually be drawn onto the mirror 11 using a felt-tip pen. It will be appreciated that if such a non-symmetrical blemish is to appear on the left hand side (as viewed) of the face, then this side must be provided by the reflection of the right hand side of the basic shape 15 in the mirror 11.

Other parts provided with the kit may include sheets of different flesh colours, from which representations of warts, moles, wrinkles and so on may be formed by cutting out suitable shapes.

Whilst the apparatus so far described can be used in the described manner by itself to provide a suitable visual representation by providing the viewer with various outlines and allowing him to try each of them in turn in the apparatus, it is desirable to provide a somewhat quicker way of selecting the correct outline for use in the apparatus. This is shown in Figure 9 and takes the form of a series of eight books, 24 each containing two printed representations of sets of variations of basic shapes. These printed representations are provided as is shown in Figures 1 to 5 in the form of a white silhouette on a black background. Although only four variations are shown in Figures 1 to 4 the books will contain a considerably larger number of possible variations with many silhouettes showing variations intermediate those shown in Figures 1 to 4. The basic shapes represented in the books 24 correspond to the basic shapes 15 provided with the above described apparatus. The books 24 each contain variations of two different basic shapes arranged one above the other. The sheets of basic shapes 15 and their corresponding sets of variations in silhouette form are similarly numbered for rapid identification.

The books are flick books having fanned edges 26 opposite the spine of book. This facilitates the rapid flicking through of the books 24 and the presentation in a rapidly changing sequence of variations on each basic shape.

Figure 10 shows an alternative type of flick book 25. Eight such books 25 are again provided, each book containing printed representations of two sets of variations of basic shapes. Each book 25 comprises a stack of

equal sized sheets which are displaced from one another so as to form two oppositely fanned edges 27 and 28. The sheets are stapled together in their middle region by a staple 29 so as to allow the book 25 to be opened at each end. Each sheet carries two printed representations 30 and 31, one on each side of the staple 29; it will be noted that the two representations are on opposite faces of the sheet (hence the representation 31, which is on the reverse side of the sheet to that shown in the drawing is drawn in dotted lines. The two sets of variations of basic shapes can be viewed separately by turning the book 25 over.

Thus a witness may be handed a number of either type of book and flick through them quickly to find which book contains the outline of the person whose representation is to be created and, having selected the book by noting the number on the book, the required basic shape will be identified. It is not essential for the witness to single out which individual silhouette in a selected book is the required one. The witness merely selects in which set of basic shapes the required silhouette appears. The basic shape 15 corresponding to this selected set of variations is then inserted in the apparatus described above. It is, of course, possible, by moving this selected basic shape 15 across the base surface 10 to produce all of the variations provided in the selected set of variations of basic shapes printed in the corresponding book.

Having created the desired visual representation the witness may check it by, for example, arranging the apparatus with the base surface 10 vertical and viewing the representation from a distance. Positioning of the apparatus in this way facilitates the photographing of the visual representation. The camera is positioned on a line bisecting the angle between the mirror 11 and the base surface 10. One of the advantages of arranging the kit in a box 20 is that the complete box containing all of the apparatus can be transported to a witness's home (which may be important if the witness is, for example, a nervous person).

After allowing the witness to create the required visual representation as above described, the mirror may then be removed from its slots 13 and the box packed leaving the basic shape 15 and representations of other features firmly adhering to the base surface 10. The apparatus may be transported back to police headquarters and, after remounting the mirror 11 on the base surface 10 (remembering to ensure that the mirror is facing the correct side), the visual representation which has been created can be photographed.

As the apparatus is very simple to use, it may be left with a witness so that a visual representation can be built up by the witness himself. As the apparatus is very simple and

relatively cheap to produce, it could well be practical to provide one or more kits at any police station, instead of, at present, having only limited numbers of identification apparatus available. In this way the apparatus may be used to produce visual representations of wanted persons in connection with more minor crimes than is at present practicable.

When a photograph has been produced of the visual representation and subsequent reproductions made therefrom, these may be distributed to various Police stations and Police Forces.

WHAT WE CLAIM IS:—

1. Apparatus for creating a visual representation of a head or face comprising a set of basic shapes of heads or faces, a set of facial features, a base surface, a substantially planar reflecting surface and means for mounting said reflecting surface in such a position with respect to said base surface that when a selected basic shape of head or face is disposed on said base surface and is moved relative to the line of intersection of the base surface and the plane of the reflecting surface, varying outlines of head or face are reproduced partly from said basic shape and partly from its reflection.

2. Apparatus as claimed in claim 1 wherein said basic shape is one half of the head or face based on a central vertical axis, the other half being provided in use by the reflection in the reflecting surface to reproduce the outline.

3. Apparatus as claimed in claim 1 wherein said basic shape is a complete outline of the head or face so that either side thereof may be reflected from the reflecting surface to reproduce the outline.

4. Apparatus as claimed in any of the preceding claims wherein said basic shapes and said facial features are photographic reproductions.

5. Apparatus as claimed in claim 4 wherein said photographic reproductions are in colour.

6. Apparatus as claimed in any of claims 1 to 5 wherein said set of facial features includes a plurality of sets of different shapes and of different colours of human features e.g. hair, eyes, eyebrows, mouths, lips, noses or ears.

7. Apparatus as claimed in any of the preceding claims wherein said base surface is planar.

8. Apparatus as claimed in any of claims 1 to 6 wherein said base surface is slightly curved and the plane of said reflecting surface extends in use along a generator of the curved base surface.

9. Apparatus as claimed in any of the preceding claims wherein the reflecting surface is a plane mirror having a pair of legs, each leg extending from an opposite edge of said mirror whereby it can be mounted in slots or recesses formed in the base surface or a frame thereof.

10. Apparatus as claimed in any of the preceding claims wherein said reflecting surface is fixed in use at right angles to said base surface.

5 11. Apparatus as claimed in any of claims 1 to 9 wherein the angle between said reflecting surface and said base surface in use is variable.

10 12. Apparatus as claimed in any of the preceding claims in which the basic shapes of head or face and the facial features are securable in a selected position relative to the base surface.

15 13. Apparatus as claimed in claim 12 wherein said basic shapes and facial features are made of or mounted on sheet material which is coated to permit them to adhere to the base surface or each other whilst being readily removable without damage.

20 14. Apparatus as claimed in any of the preceding claims further including means for rapidly selecting one from a number of different basic shapes of head or face.

25 15. Apparatus as claimed in claim 14 wherein said means comprises a number of different basic shapes of head or face attached together in the form of a book so that by running a finger over the edge of the pages of such book a rapidly changing shape can be viewed.

30 16. Apparatus as claimed in claim 15 wherein said different basic shapes comprise a silhouette of a selected basic shape of head or face and a number of variations thereof, which variations are made by varying the spacing and mutual inclination of the sides of the basic shape relative to each other.

35 17. Apparatus as claimed in claim 16 wherein the basic shape is in the form of a black silhouette with a white background.

40 18. Apparatus as claimed in claim 16 wherein the basic shape is in the form of a white silhouette with a black background.

45 19. Apparatus as claimed in any of claims 16 to 18 wherein said basic shapes and the variations thereof are mounted on the outside edge of each of the pages of said book so that upon turning successive pages of the book in rapid succession each basic shape and its variations are viewed.

50 20. Apparatus as claimed in claim 19 wherein the different basic shapes are mounted in rows one above the other at the outside edge of each page, so that several different basic shapes and the variations thereof may be viewed at the same time.

55 21. Apparatus as claimed in any of claims 16 to 18 wherein said book comprises a number of pages attached together in their middle region so that either of two opposite edges of the pages may be turned, one different basic shape being provided on each opposite edge of one page, and the variations of each of the two basic shapes being provided

on the corresponding edge of successive pages. 65

22. Apparatus as claimed in claim 21 wherein one basic shape and variations thereof are provided on the edge of one surface of each of said pages and the other basic shape and variations thereof are provided on the opposite edge of each of said pages but on the reverse surface thereof so that only one basic shape may be viewed at one time, the other basic shape being viewed by turning the book upside-down. 70 75

23. Apparatus as claimed in any of claims 19 to 22 wherein the pages of said book are fanned to facilitate rapid viewing of said basic shapes. 80

24. Apparatus as claimed in any of the preceding claims including a box which has the base surface mounted therein, said box serving in use to house the reflecting surface, all the basic shapes, and facial features, needed for producing a visual representation. 85

25. Apparatus as claimed in claim 24 wherein said box incorporates mounting means for said reflecting surface.

26. Apparatus for creating a visual representation of a head or face substantially as hereinbefore described with reference to the drawings accompanying the Provisional Specification. 90

27. A method of creating a visual representation of a head or face, including the steps of selecting a basic shape of head or face from a set of such basic shapes, positioning such basic shape adjacent to a reflecting surface so as to produce partly from the basic shape and partly from its reflection in said surface the outline of a head or face, causing relative movement between the selected basic shape and said reflecting surface until said outline corresponds to a desired outline, securing said basic shape in the desired position with respect to said reflecting surface, and applying to said basic shape and/or its reflection one or more selected facial features. 95 100 105

28. The method as claimed in claim 27 wherein said basic shape is a complete outline of the head or face so that a selected side thereof may be reflected from the reflecting surface to reproduce the outline. 110

29. A method as claimed in claim 28 including the further step of marking non-symmetrical facial features or blemishes onto the reflecting surface so that they will appear on one side only of the visual representation. 115

30. A method as claimed in any of claims 27 to 29 including the step of photographing the completed visual representation. 120

31. A method as claimed in any of claims 27 to 30 including the step of presenting a large number of basic shapes and variations thereof in rapid sequence to a witness so that the witness can select whichever basic shape most nearly agrees with a recollected shape. 125

32. A method of creating a visual representation of a head or face substantially as described with reference to the drawings accompanying the Provisional Specification.

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2 SHEETS

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FIG.1.

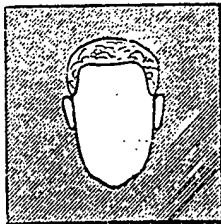


FIG.2.

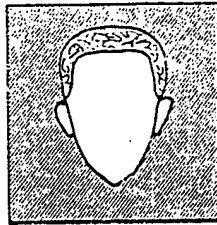


FIG.3.

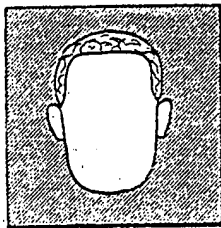


FIG.4.

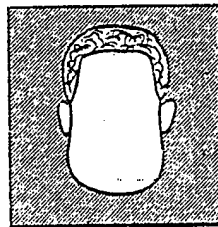


FIG.5.

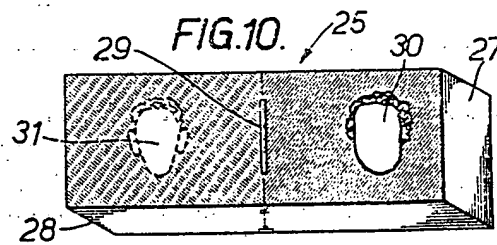
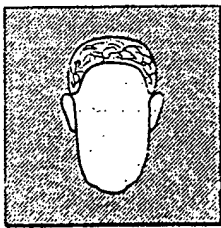
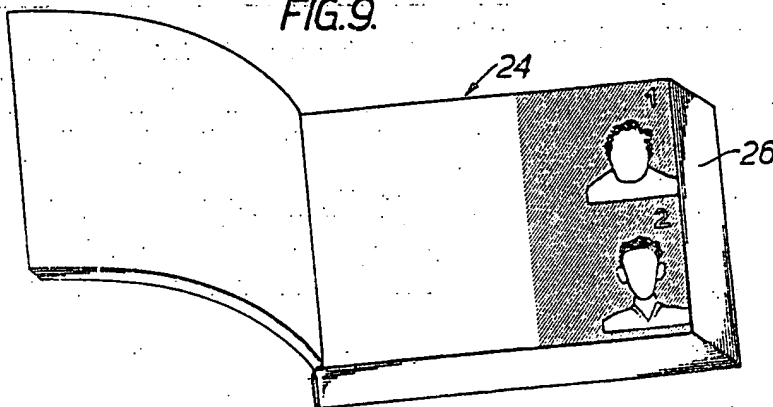


FIG.9.



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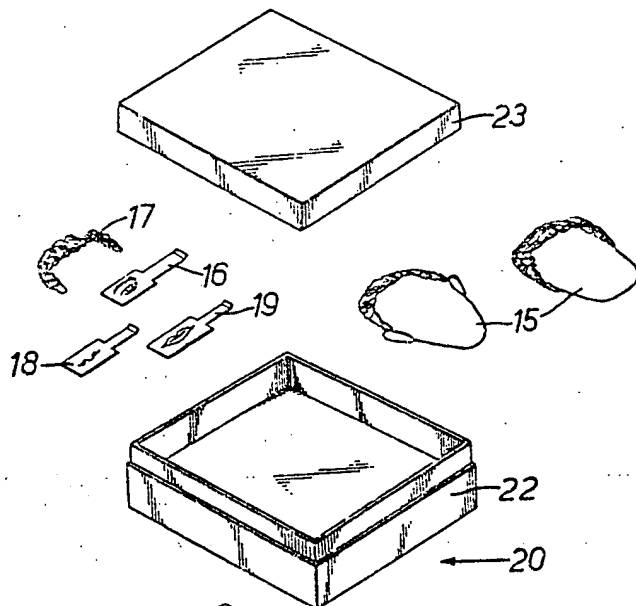


FIG. 6.

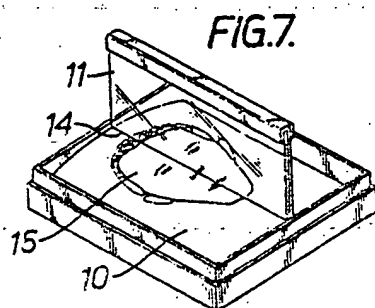
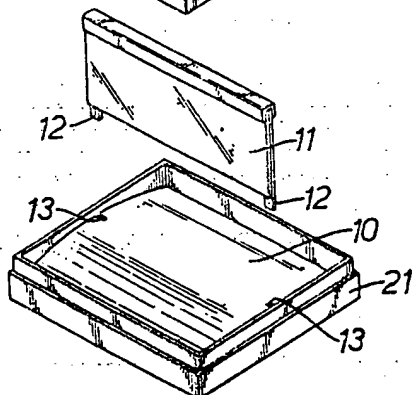


FIG. 7.

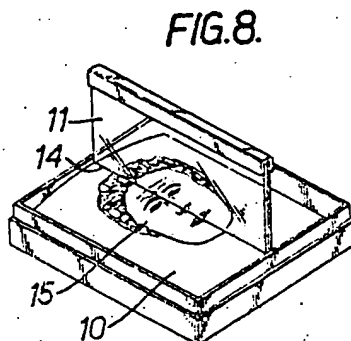


FIG. 8.

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